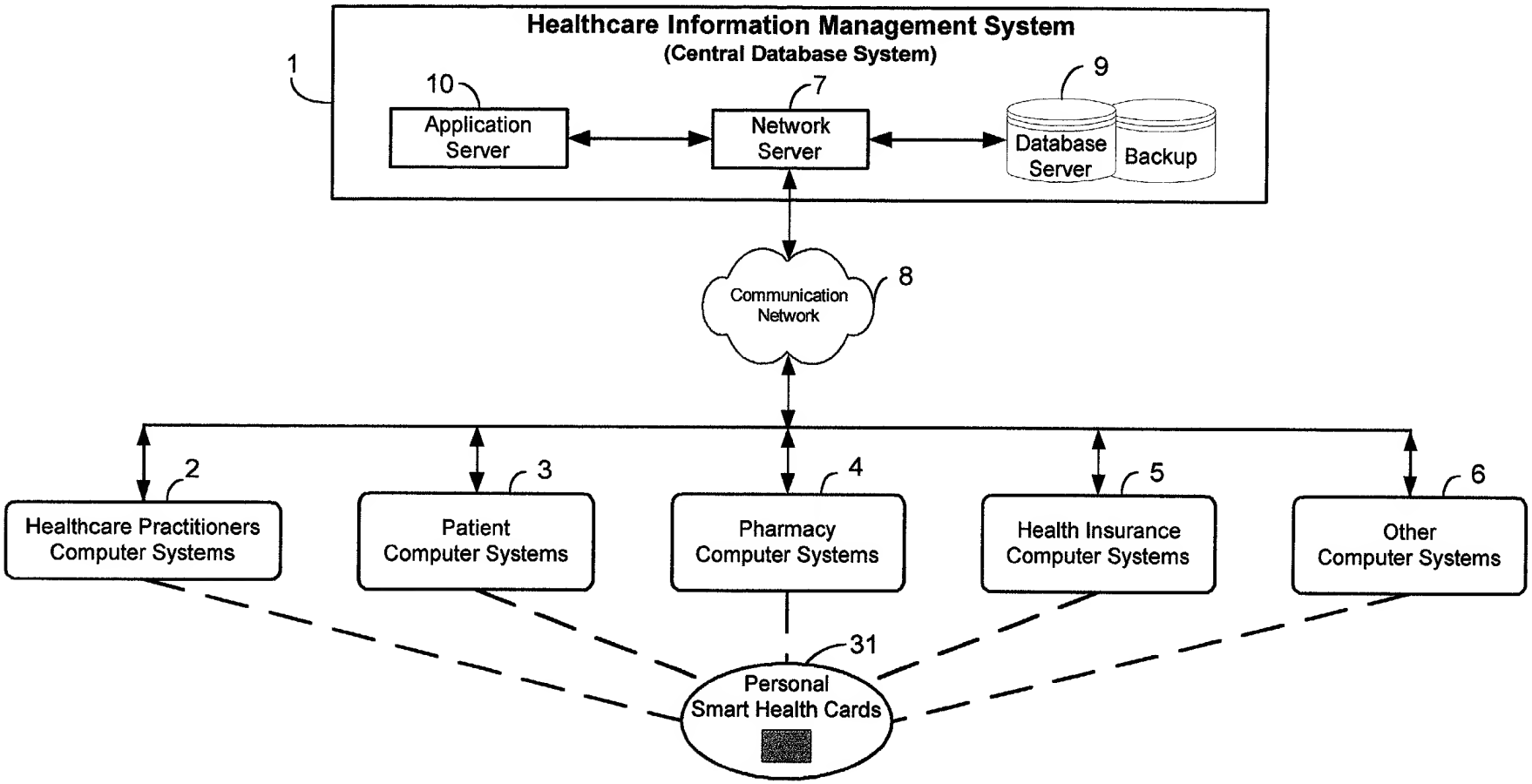
Healthcare Information Management System
(Central Database System)
1
10
Application Server
7
Network Server
9
Database Server
Backup
Communication Network
8
2
Healthcare Practitioners Computer Systems
3
Patient Computer Systems
4
Pharmacy Computer Systems
5
Health Insurance Computer Systems
6
Other Computer Systems
31
Personal Smart Health Cards

FIG. 1

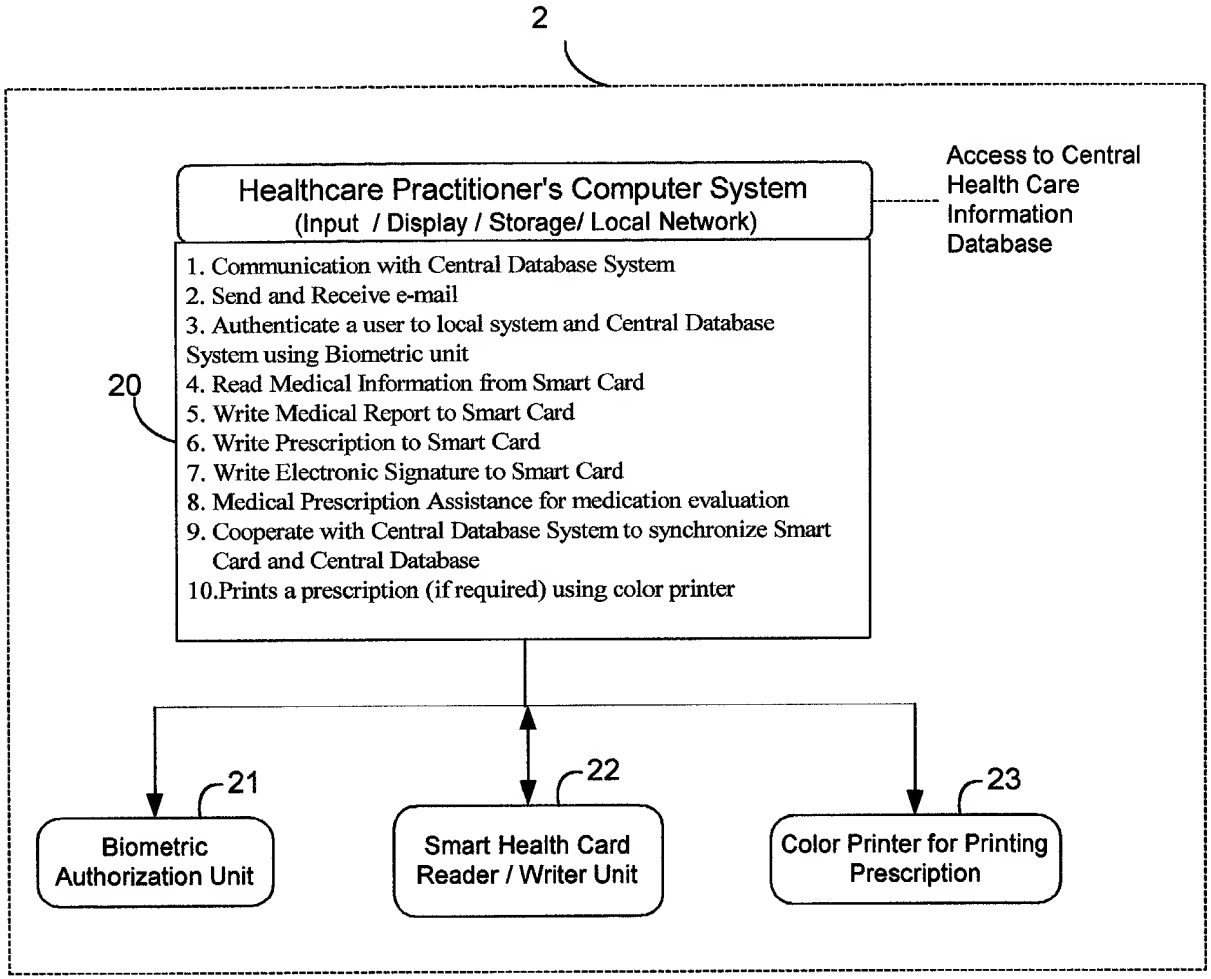
2
Healthcare Practitioner's Computer System
(Input / Display / Storage/ Local Network)
Access to Central Health Care Information Database
1. Communication with Central Database System
2. Send and Receive e-mail
3. Authenticate a user to local system and Central Database System using Biometric unit
20
4. Read Medical Information from Smart Card
5. Write Medical Report to Smart Card
6. Write Prescription to Smart Card
7. Write Electronic Signature to Smart Card
8. Medical Prescription Assistance for medication evaluation
9. Cooperate with Central Database System to synchronize Smart Card and Central Database
10.Prints a prescription (if required) using color printer
21
Biometric Authorization Unit
22
Smart Health Card Reader / Writer Unit
23
Color Printer for Printing Prescription

FIG.2

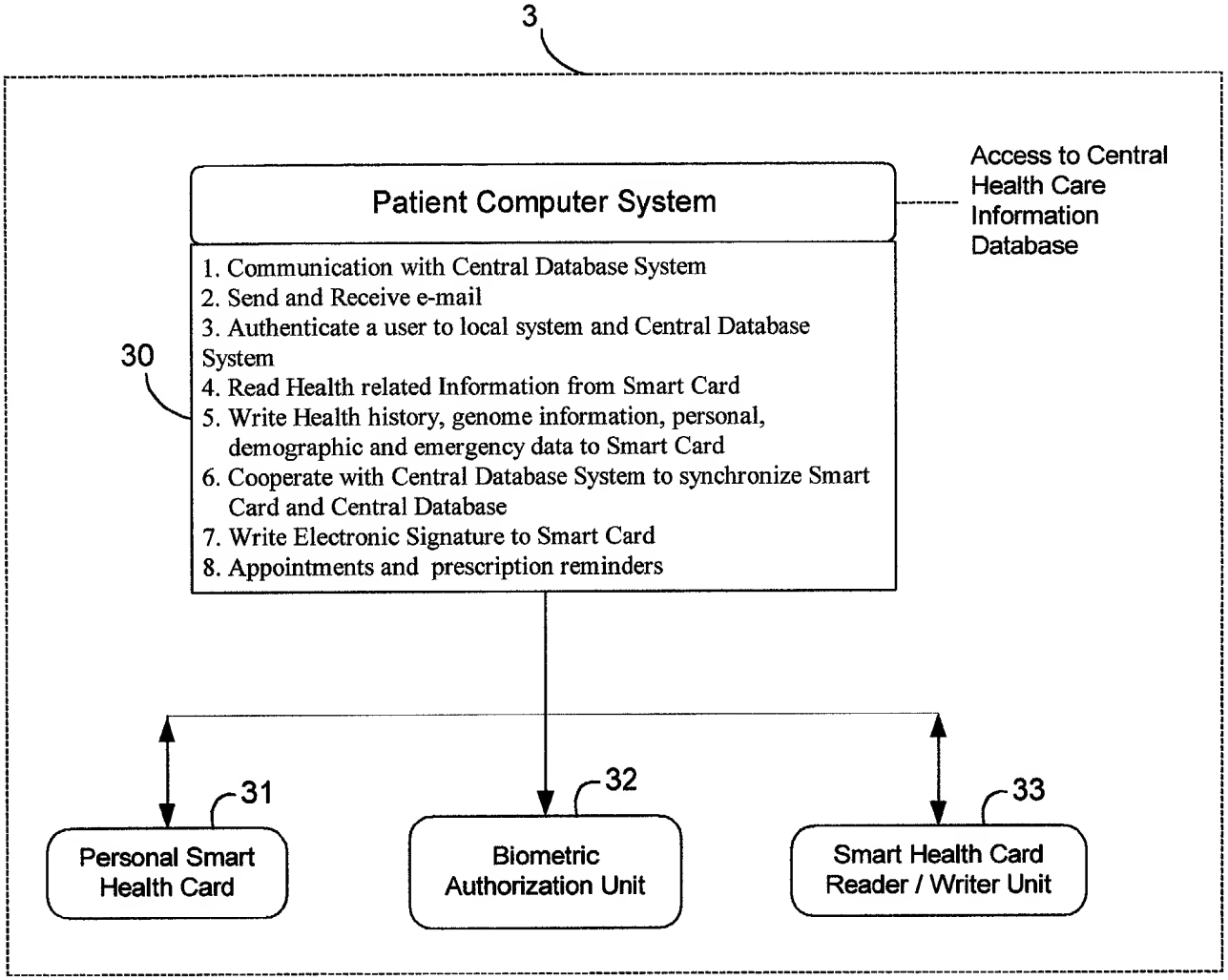
3
Patient Computer System
Access to Central Health Care Information Database
1. Communication with Central Database System
2. Send and Receive e-mail
3. Authenticate a user to local system and Central Database System
4. Read Health related Information from Smart Card
5. Write Health history, genome information, personal, demographic and emergency data to Smart Card
6. Cooperate with Central Database System to synchronize Smart Card and Central Database
7. Write Electronic Signature to Smart Card
8. Appointments and prescription reminders
30
31
32
33
Personal Smart Health Card
Biometric Authorization Unit
Smart Health Card Reader / Writer Unit

FIG.3

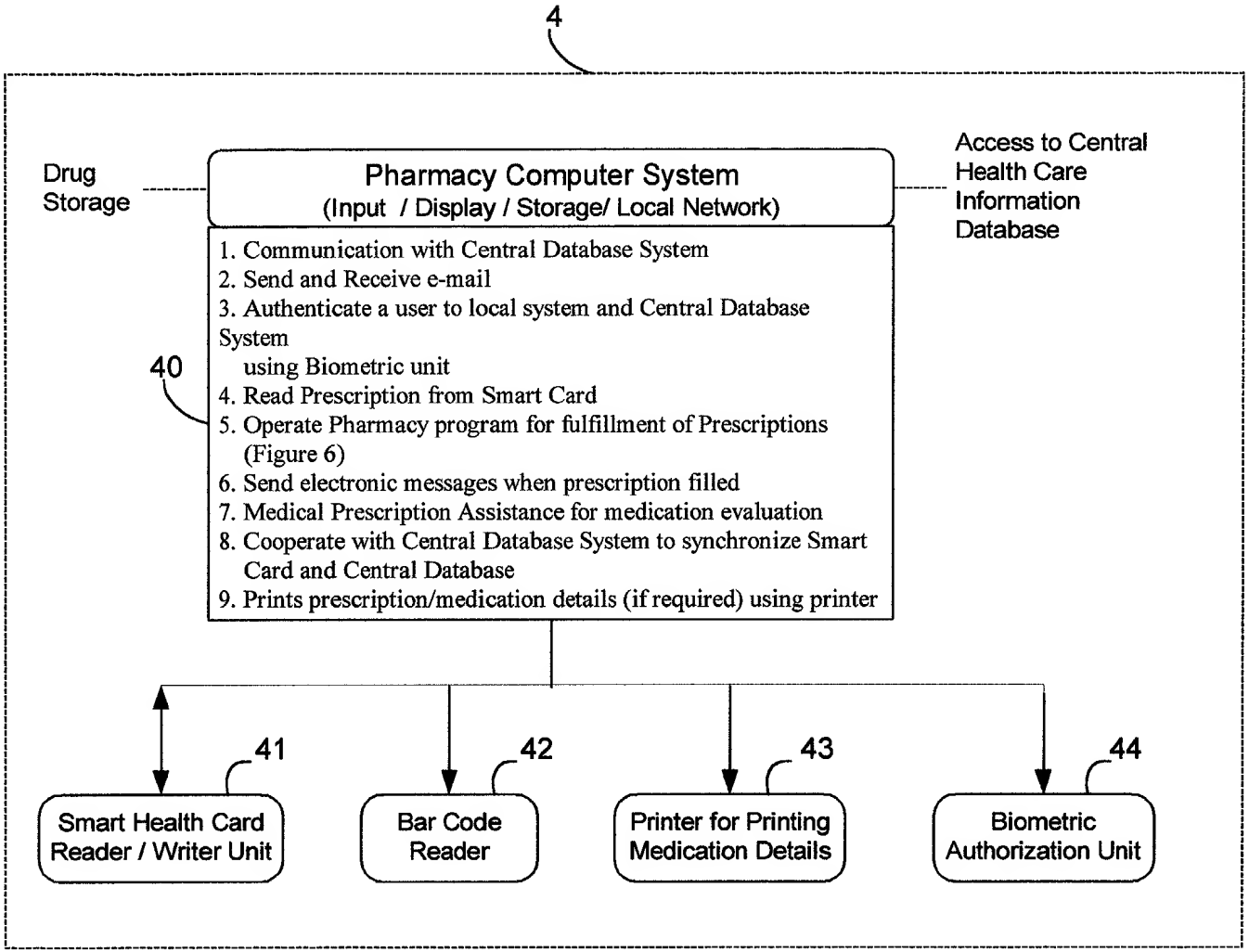
4
Drug Storage
Pharmacy Computer System
(Input / Display / Storage/ Local Network)
Access to Central Health Care Information Database
1. Communication with Central Database System
2. Send and Receive e-mail
3. Authenticate a user to local system and Central Database System
using Biometric unit
4. Read Prescription from Smart Card
5. Operate Pharmacy program for fulfillment of Prescriptions (Figure 6)
6. Send electronic messages when prescription filled
7. Medical Prescription Assistance for medication evaluation
8. Cooperate with Central Database System to synchronize Smart Card and Central Database
9. Prints prescription/medication details (if required) using printer
40
41
42
43
44
Smart Health Card Reader / Writer Unit
Bar Code Reader
Printer for Printing Medication Details
Biometric Authorization Unit

FIG. 4

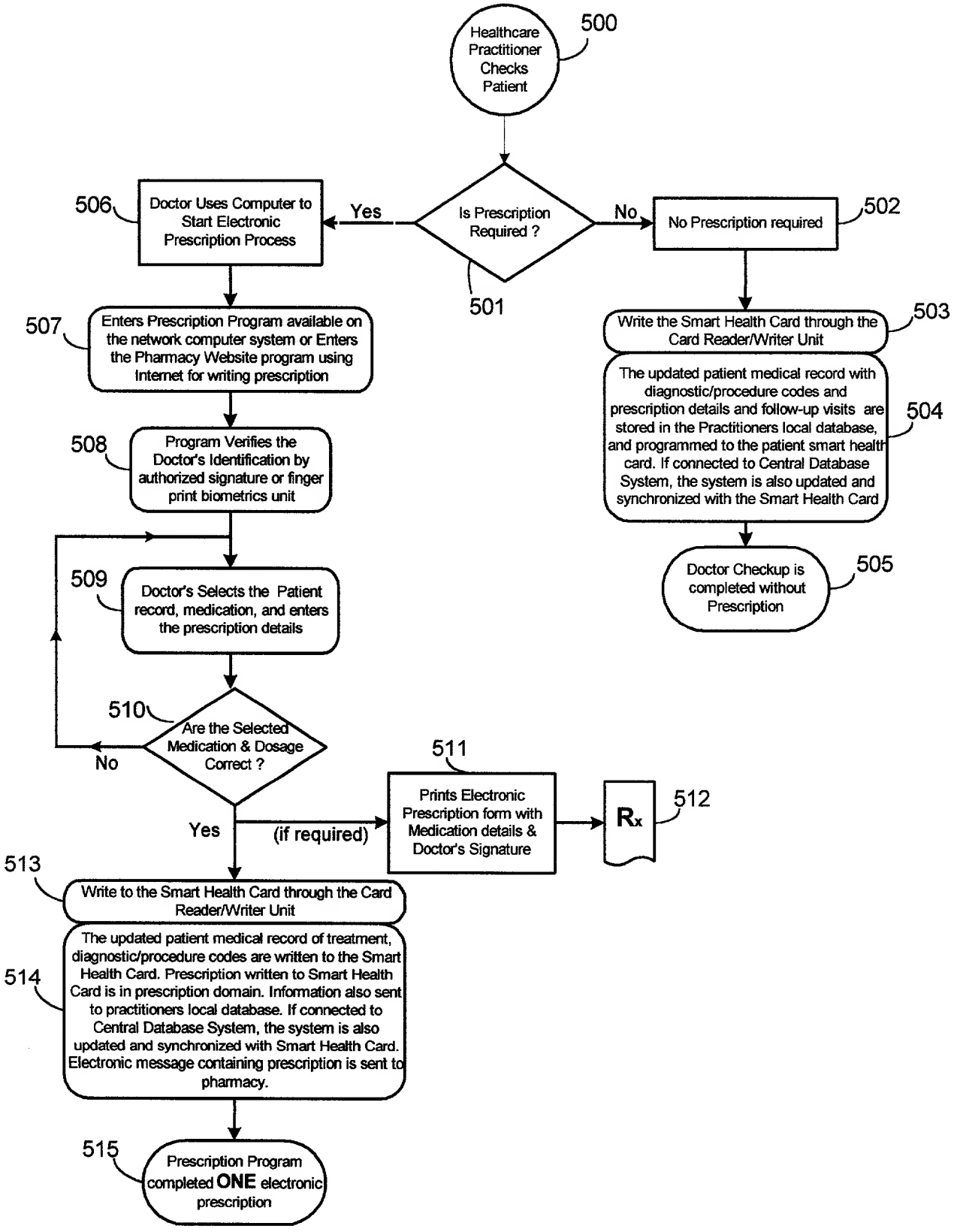
Healthcare Practitioner Checks Patient
500
Is Prescription Required ?
501
Yes
No
506
Doctor Uses Computer to Start Electronic Prescription Process
No Prescription required
502
507
Enters Prescription Program available on the network computer system or Enters the Pharmacy Website program using Internet for writing prescription
Write the Smart Health Card through the Card Reader/Writer Unit
503
The updated patient medical record with diagnostic/procedure codes and prescription details and follow-up visits are stored in the Practitioners local database, and programmed to the patient smart health card. If connected to Central Database System, the system is also updated and synchronized with the Smart Health Card
504
508
Program Verifies the Doctor's Identification by authorized signature or finger print biometrics unit
Doctor Checkup is completed without Prescription
505
509
Doctor's Selects the Patient record, medication, and enters the prescription details
510
Are the Selected Medication & Dosage Correct ?
No
511
Yes
(if required)
Prints Electronic Prescription form with Medication details & Doctor's Signature
Rx
512
513
Write to the Smart Health Card through the Card Reader/Writer Unit
514
The updated patient medical record of treatment, diagnostic/procedure codes are written to the Smart Health Card. Prescription written to Smart Health Card is in prescription domain. Information also sent to practitioners local database. If connected to Central Database System, the system is also updated and synchronized with Smart Health Card. Electronic message containing prescription is sent to pharmacy.
515
Prescription Program completed ONE electronic prescription

FIG. 5

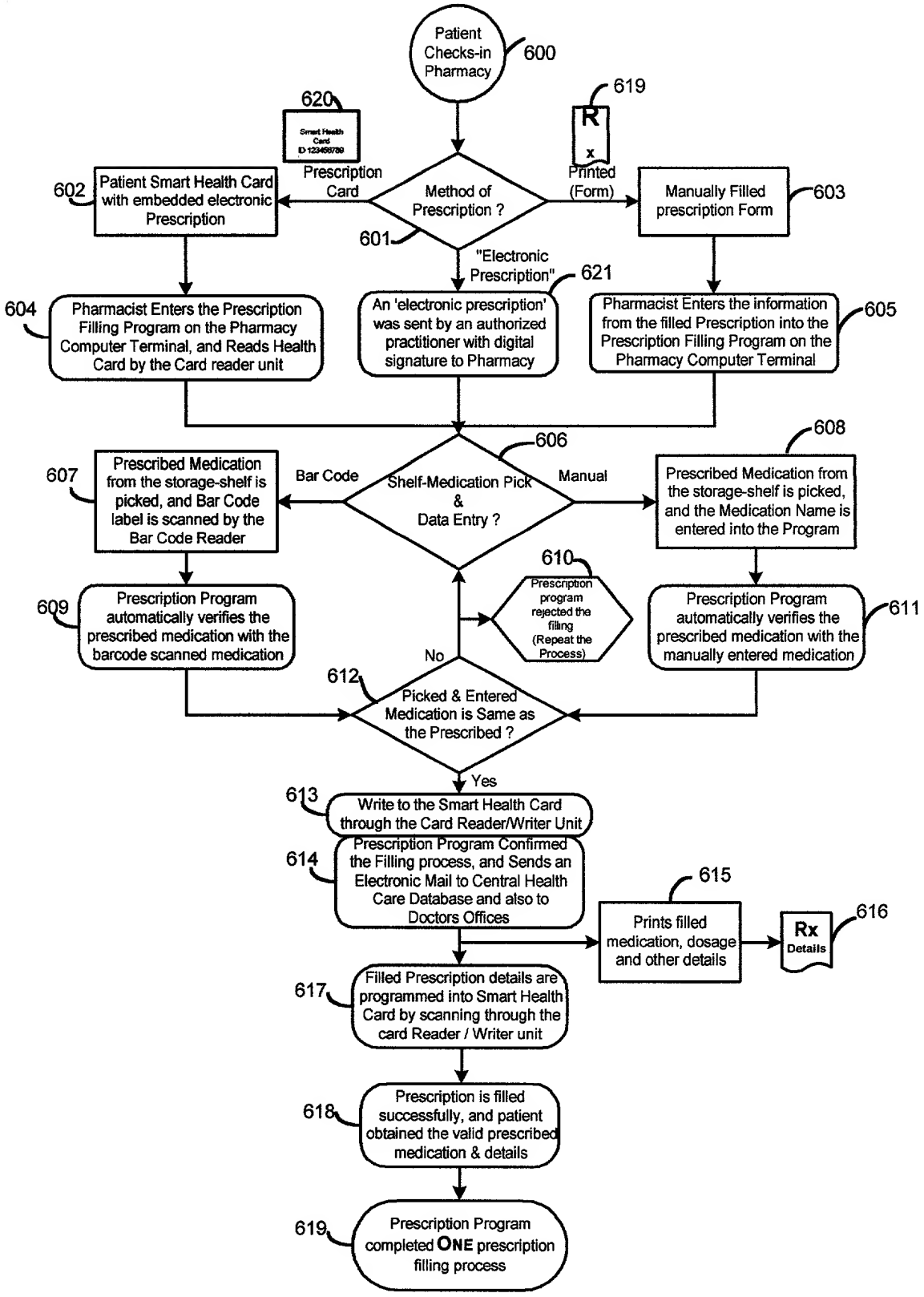
Patient Checks-in Pharmacy
600
620
Smart Health Card ID 123456789
619
R
x
Prescription Card
Method of Prescription ?
Printed (Form)
602
Patient Smart Health Card with embedded electronic Prescription
601
Manually Filled prescription Form
603
"Electronic Prescription"
621
604
Pharmacist Enters the Prescription Filling Program on the Pharmacy Computer Terminal, and Reads Health Card by the Card reader unit
An 'electronic prescription' was sent by an authorized practitioner with digital signature to Pharmacy
Pharmacist Enters the information from the filled Prescription into the Prescription Filling Program on the Pharmacy Computer Terminal
605
606
608
607
Prescribed Medication from the storage-shelf is picked, and Bar Code label is scanned by the Bar Code Reader
Bar Code
Shelf-Medication Pick & Data Entry ?
Manual
Prescribed Medication from the storage-shelf is picked, and the Medication Name is entered into the Program
610
609
Prescription Program automatically verifies the prescribed medication with the barcode scanned medication
Prescription program rejected the filling (Repeat the Process)
Prescription Program automatically verifies the prescribed medication with the manually entered medication
611
No
612
Picked & Entered Medication is Same as the Prescribed ?
Yes
613
Write to the Smart Health Card through the Card Reader/Writer Unit
614
Prescription Program Confirmed the Filling process, and Sends an Electronic Mail to Central Health Care Database and also to Doctors Offices
615
Prints filled medication, dosage and other details
Rx Details
616
617
Filled Prescription details are programmed into Smart Health Card by scanning through the card Reader / Writer unit
618
Prescription is filled successfully, and patient obtained the valid prescribed medication & details
619
Prescription Program completed ONE prescription filling process

FIG. 6

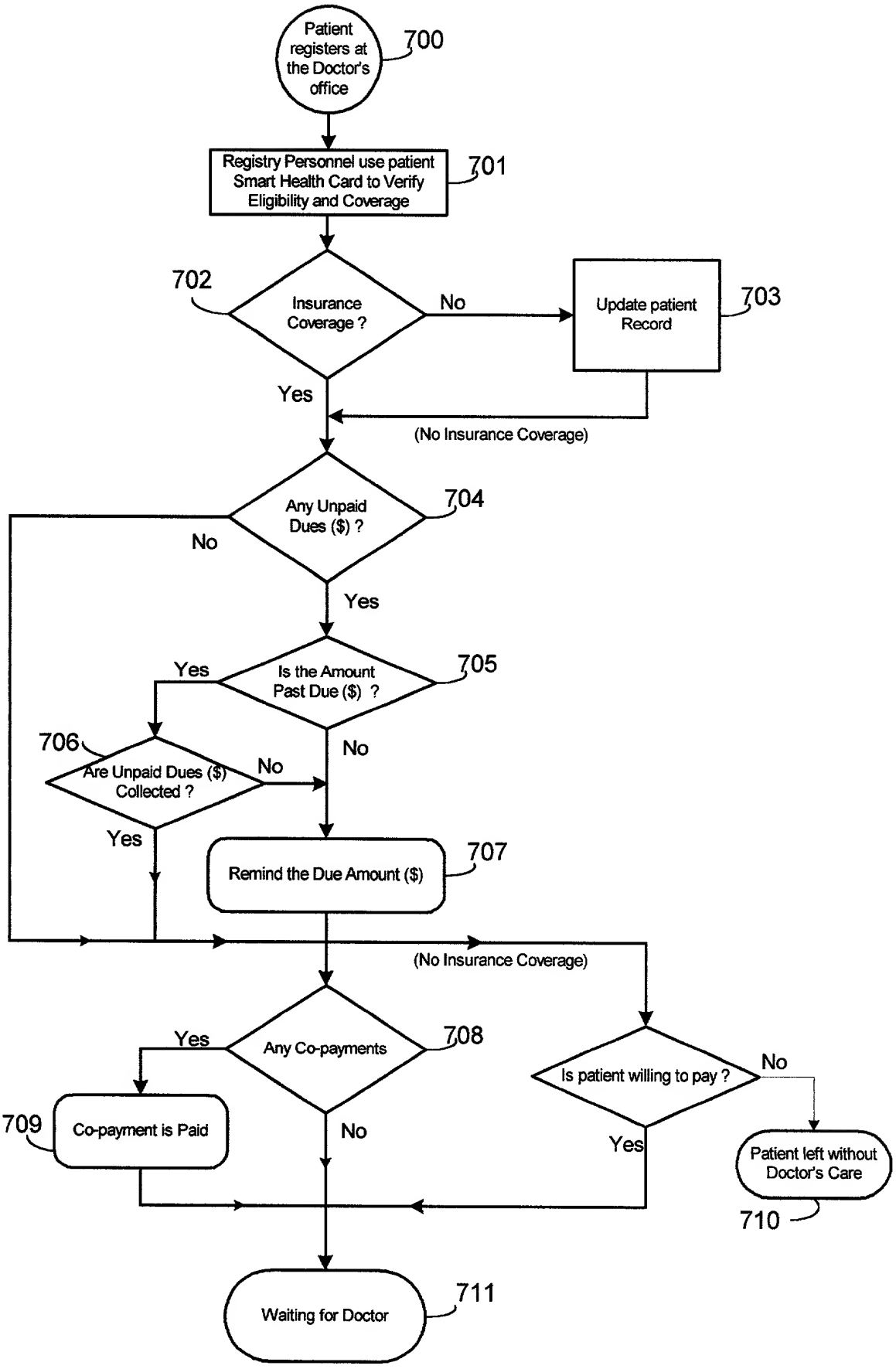
Patient registers at the Doctor's office
700
Registry Personnel use patient Smart Health Card to Verify Eligibility and Coverage
701
702
Insurance Coverage ?
No
Update patient Record
703
Yes
(No Insurance Coverage)
Any Unpaid Dues ($) ?
704
No
Yes
Yes
Is the Amount Past Due ($) ?
705
706
Are Unpaid Dues ($) Collected ?
No
No
Yes
Remind the Due Amount ($)
707
(No Insurance Coverage)
Yes
Any Co-payments
708
Is patient willing to pay ?
No
709
Co-payment is Paid
No
Yes
Patient left without Doctor's Care
710
Waiting for Doctor
711

FIG. 7

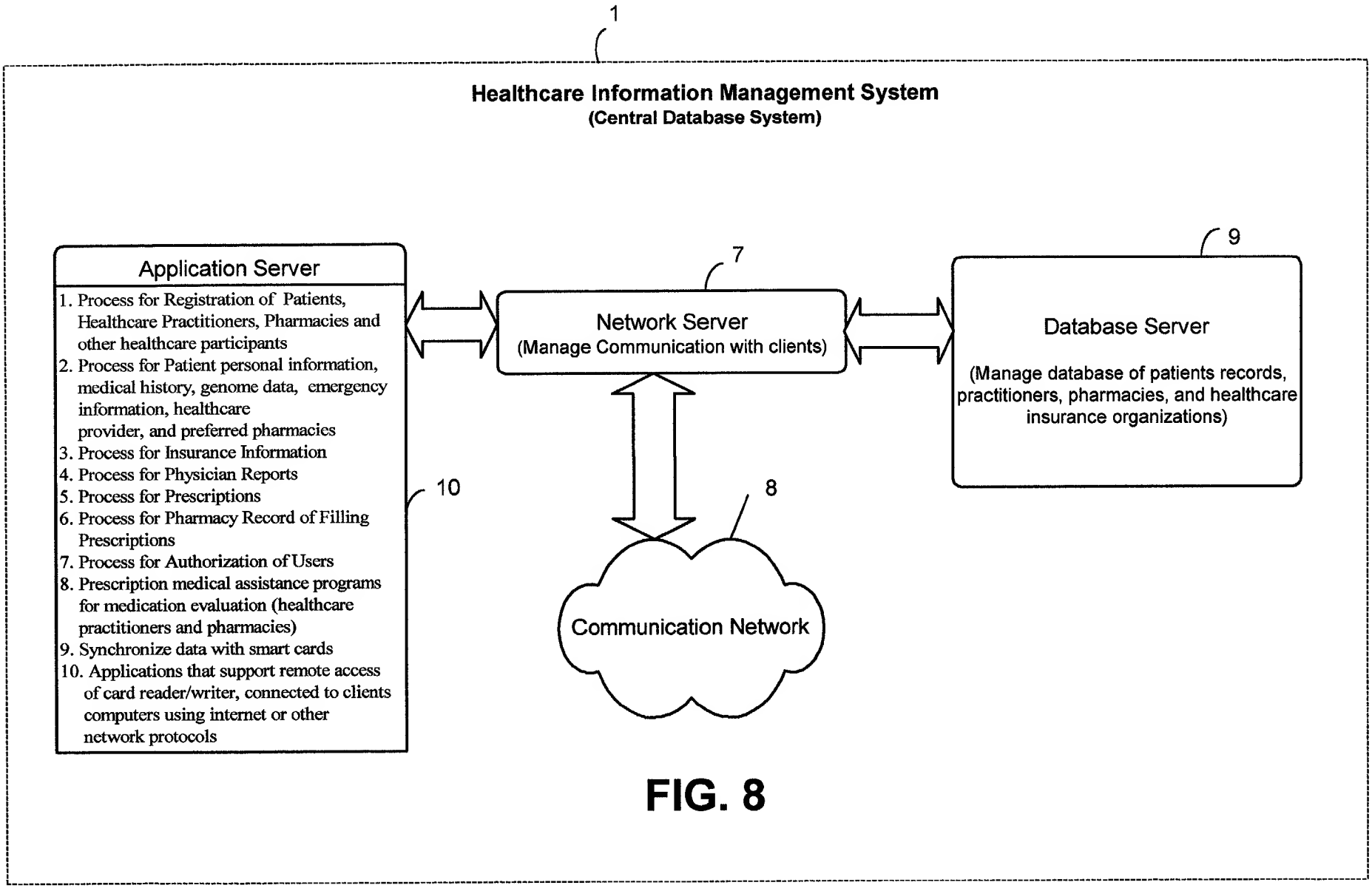
1
Healthcare Information Management System
(Central Database System)
Application Server
1. Process for Registration of Patients, Healthcare Practitioners, Pharmacies and other healthcare participants
2. Process for Patient personal information, medical history, genome data, emergency information, healthcare provider, and preferred pharmacies
3. Process for Insurance Information
4. Process for Physician Reports
5. Process for Prescriptions
6. Process for Pharmacy Record of Filling Prescriptions
7. Process for Authorization of Users
8. Prescription medical assistance programs for medication evaluation (healthcare practitioners and pharmacies)
9. Synchronize data with smart cards
10. Applications that support remote access of card reader/writer, connected to clients computers using internet or other network protocols
10
7
Network Server
(Manage Communication with clients)
9
Database Server
(Manage database of patients records, practitioners, pharmacies, and healthcare insurance organizations)
8
Communication Network

FIG. 8

SMART HEALTH CARD DOMAINS 900

PERSONAL DATA	901
INSURANCE DATA	902
EMERGENCY CONTACTS	903
VITAL DATA	904
DIAGNOSTIC DATA	905
MEDICAL DOCTORS	906
DENTAL DOCTORS	907
VISION DOCTORS	908
DOCTOR/HOSPITAL VISITS	909
HOSPITALIZATION	910
SURGERY INFORMATION	911
LAB TESTS REPORT	912
PHARMACIES	913
PRESCRIPTIONS	914
NON-PRESCRIPTION DRUGS	915
VITAMINS	916
ALLERGIES	917
ADVERSE REACTIONS	918
FITNESS PROFILE	919
FAMILY PROFILE	920
DENTAL DATA	921
VISION DATA	922
X-RAY DATA	923
SAMPLE MEDICATION PRESCRIPTIONS	924
SCHEDULER DATA	925
Specific Internet / Web Addresses (URL's)	926
Organ Donor Consent Data	927
Personal DNA/Genome Data	928

FIG. 9

FIG. 10
READ/WRITE ACCESS TO USERS

PATIENT	PHYSICIAN	PHARMACY	DESCRIPTION
X	R/W	X	Physician Registration
X	X	R/W	Pharmacy Registration
R/W	X	X	Patient Registration
R/W	R	R	Personal Information
R/W	R	X	Emergency Information
R/W	R	R	Insurance Information
R/W	R/W	R	Health Care Providers Information
R/W	R	R/W	Preferred Pharmacy Information
R/W	R/W	X	Current Health Conditions
R	R/W	X	Physician Observations and Prescriptions
R	R	R/W	Pharmacy Prescriptions Fulfillment

R => Read Only Access
R/W => Read ad Write Access
W => Write Only Access
X => No Access